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DOUBLE RESONANCE SPECTROSCOPY OF BaF AUTOIONIZING RYDBERG STATES

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We have studied the ν=1 Rydberg states of BaF in the energy region E=38800-39100 cm^{-1}(n*=15-25) via optical-optical double resonance spectroscopy. Rydberg states excited above the first ionization potential spontaneously autoionize and $^{138}Ba^{19}F^{+}$ ions are detected by TOF-MS. In addition, BaF possesses a particularly low ionization potential, which allows for the study of autoionization dynamics in the absence of predissociative decay. This work extends the assignments of core-penetrating Rydberg states of BaF (Jakubek and Field, 2000) for applications to state-selective ion production schemes. Polarization and Stark spectroscopy techniques will be discussed in the context of accurate and efficient assignment of spectra.